AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) Tire wear monitoring system, including a wearing part ~~(110,111)~~ to be monitored, said wearing part ~~(110,111)~~ being associated with magnetic elements ~~(113)~~ and magnetic field sensing means ~~(114)~~, for sensing an intensity of a magnetic field emitted by said magnetic elements ~~(113)~~, associated with said wearing part ~~(113)~~ of said tire,

wherein ~~characterized in that~~ said magnetic field sensing means ~~(114)~~ for sensing an intensity of a magnetic field emitted by said magnetic elements ~~(113)~~ are associated with a wheel to which said tire belongs, and

wherein the wearing part comprises tire tread with magnetic particles inserted therein that act as the magnetic elements.

2. (Currently Amended) System according to claim 1, wherein ~~characterized in that~~ said magnetic field sensing means ~~(114)~~ for sensing an intensity of a magnetic field emitted by said magnetic elements ~~(113)~~ are associated with a rim of said wheel.

3. (Currently Amended) System according to claim 1, wherein ~~characterized in that~~ said magnetic field sensing means ~~(114)~~ for sensing an intensity of a magnetic field emitted by said magnetic elements ~~(113)~~ are associated with the tire of said wheel.

4. (Currently Amended) System according to claim 3, wherein ~~characterized in that~~ said magnetic field sensing means ~~(114)~~ for sensing an intensity of a magnetic field emitted by said magnetic elements ~~(113)~~ are inserted close to the wearing part ~~(110,113)~~ of said tire.

5. (Currently Amended) System according to claim 3, wherein~~characterized in that~~ said magnetic field sensing means ~~(114)~~ for sensing an intensity of a magnetic field emitted by said magnetic elements ~~(113)~~ are applied to the internal part of said tire.

6. (Currently Amended) System according to claim 4, wherein~~characterized in that~~ said magnetic field sensing means ~~(114)~~ for sensing an intensity of a magnetic field emitted by said magnetic elements ~~(113)~~ are located close to blocks ~~(111)~~ of said wearing part ~~(110)~~ of the tire.

7. (Currently Amended) System according to claim 1, wherein~~characterized in that~~ said magnetic field sensing means ~~(114)~~ include one or multiple sensors comprising magnetoresistive elements ~~(10; 20)~~ suitable for varying their resistance in correspondence with the intensity variation of the magnetic field generated by said magnetic elements ~~(113)~~.

8. (Currently Amended) System according to claim 7, wherein~~characterized in that~~ said magnetoresistive element ~~(20)~~ includes metal conduction regions ~~(13; 23)~~, comprised of metal nanoparticles ~~(37)~~, and semiconductive conduction regions ~~(11; 31)~~ in a configuration of disordered mesoscopic structure.

9. (Currently Amended) System according to claim 7, wherein~~characterized in that~~ said magnetoresistive element ~~(20)~~ includes pores ~~(12; 22)~~ in a semiconductor substrate ~~(11; 31)~~, metal ~~(13; 23)~~ being deposited in said pores ~~(12; 22)~~.

10. (Currently Amended) System according to claim 1, wherein~~characterized in that~~ said magnetic elements ~~(113)~~ are substantially located in correspondence with blocks ~~(113)~~ of said wearing part ~~(110)~~.

11. (Currently Amended) Monitoring system of the physical properties of a tire, wherein the system~~characterized in that it~~ includes a control unit ~~(56)~~ in a signal communication relation with sensing means ~~(113, 114; 60,61, 62)~~ of said physical properties and conversion means of the

vibrational energy associated with the tire motion, ~~in particular of vibrational energy,~~ in electric energy, and

wherein said sensing means of physical properties include the magnetic elements and the magnetic sensing devices configured according to the system according to claim 1.

12. (Cancelled).

13. (Currently Amended) System according to claim 11, wherein~~characterized in that~~ said sensing means ~~(60,61, 62)~~ of physical properties include one or multiple magnetic sensing devices ~~(61,62)~~ placed to predetermined distances ~~(d1, d2)~~ from a magnetic element ~~(60)~~ associated with a region of the tire ~~(52)~~ for measuring the pressure thereof.

14. (Currently Amended) System according to claim 13, wherein~~characterized in that~~ said magnetic sensing devices ~~(61,62)~~ include one or multiple sensors including magnetoresistive elements ~~(10; 20)~~ suitable for varying their resistance in correspondence with the intensity variation of the magnetic field generated by the variation of said predetermined distances ~~(d1, d2)~~ from a magnetic element ~~(60)~~ associated with a region of the tire ~~(52)~~ for measuring the pressure thereof.

15. (Currently Amended) System according to claim 14, wherein~~characterized in that~~ said magnetoresistive element ~~(20)~~ includes metal conduction regions ~~(13; 23)~~, comprised of metal nanoparticles ~~(37)~~ and semiconductive conduction regions ~~(11; 31)~~ in a configuration of disordered mesoscopic structure.

16. (Currently Amended) System according to claim 15, wherein~~characterized in that~~ said magnetoresistive element ~~(20)~~ includes pores ~~(12; 22)~~ in a semiconductor substrate ~~(11; 31)~~, metal ~~(13; 23)~~ being deposited in said pores ~~(12; 22)~~.

17. (New) Tire wear monitoring system, including a wearing part to be monitored, said wearing part being associated with magnetic elements and magnetic field sensing means, for sensing an intensity of a magnetic field emitted by said magnetic elements, associated with said wearing part of said tire,

wherein said magnetic field sensing means for sensing an intensity of a magnetic field emitted by said magnetic elements are associated with a wheel to which said tire belongs,

wherein the magnetic elements are inserted into the wearing part, and

wherein the magnetic field sensing means are inserted into the wearing part.

18. (New) System according to claim 17, wherein the wearing part comprises tire tread, and the magnetic elements and the magnetic field sensing means are located in the tire tread.

19. (New) System according to claim 18, wherein the magnetic elements are substantially located in correspondence with blocks of the wearing part.

20. (New) System according to claim 19, wherein the blocks have centered vertical axes sections, and wherein the magnetic field sensing devices measure the intensity variation of the magnetic field along the sections.

21. (New) System according to claim 17, wherein said magnetic field sensing means for sensing an intensity of a magnetic field emitted by said magnetic elements are associated with a rim of said wheel.

22. (New) System according to claim 17, wherein said magnetic field sensing means for sensing an intensity of a magnetic field emitted by said magnetic elements are associated with the tire of said wheel.

23. (New) System according to claim 22, wherein said magnetic field sensing means for sensing an intensity of a magnetic field emitted by said magnetic elements are inserted close to the wearing part of said tire.

24. (New) System according to claim 17, wherein said magnetic field sensing means include one or multiple sensors comprising magnetoresistive elements suitable for varying their resistance in correspondence with the intensity variation of the magnetic field generated by said magnetic elements.

25. (New) System according to claim 24, wherein said magnetoresistive element includes metal conduction regions, comprised of metal nanoparticles, and semiconductive conduction regions in a configuration of disordered mesoscopic structure.

26. (New) System according to claim 24, wherein said magnetoresistive element includes pores in a semiconductor substrate, metal being deposited in said pores.